Site A/Plot M Disposal Site
Chicago, Illinois
Long-Term Surveillance and Maintenance Program

U.S. Department of Energy
Grand Junction Office

F A C T S H E E T

The Grand Junction Office has provided cost-effective and efficient stewardship for more than 10 years

Overview

Site A/Plot M is situated on the former grounds of Argonne National Laboratory and its predecessor, the University of Chicago Metallurgical Laboratory. Site A contains buried contaminated building debris and the biological shield for the Chicago Pile (CP)–3 nuclear reactor. Plot M contains radioactive wastes buried in trenches from the mid-1940s to 1949. Both Site A and Plot M were decommissioned in 1956. In 1998, responsibility for the site was transferred from the U.S. Department of Energy (DOE) Chicago Operations Office to the Long-Term Surveillance and Maintenance (LTSM) Program at the DOE Grand Junction Office.

In 1988, DOE established the LTSM Program to provide stewardship of low-level radioactive disposal sites after completion of environmental restoration activities. The mission of the LTSM Program is to ensure that the disposal cell systems continue to prevent release of contaminated materials to the environment. These materials will remain potentially hazardous for thousands of years. As long as the cells function as designed, risks to human health and the environment are negligible.

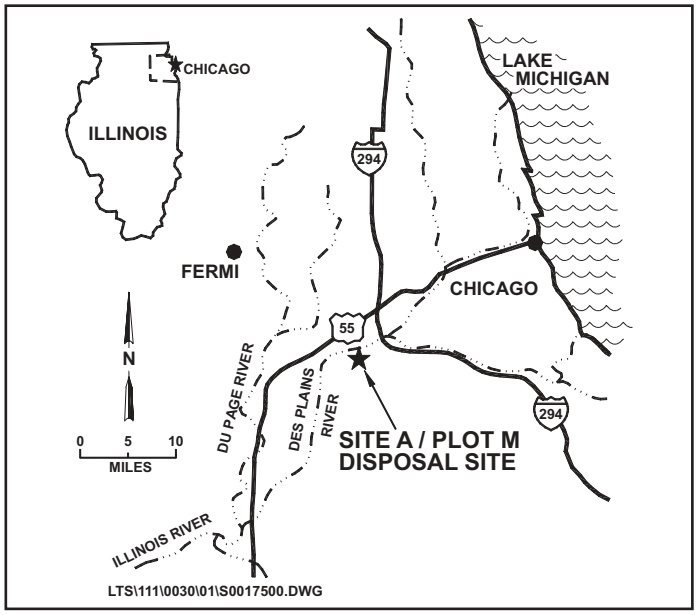
The LTSM Program maintains the safety and integrity of the disposal site through periodic monitoring, inspections, and maintenance; serves as a point of contact for stakeholders; and maintains an information repository for all sites in the LTSM Program at the DOE Grand Junction Office.

Regulatory Setting

This site was remediated under the DOE Defense Decontamination and Decommissioning Program. The primary standard governing stewardship activities at Site A/Plot M is DOE Order 5400.5, *Radiation Protection of the Public and the Environment.* This order establishes dose limits and radiological protection standards for workers and the public. Other guidance is available in the DOE orders system.

Site A/Plot M Disposal Site

Site A/Plot M is located within the Palos Forest Preserve District of Cook County, Illinois, approximately 20 miles southwest of downtown Chicago. Site A is a 19-acre area that contained early experimental laboratories and nuclear reactor facilities. Plot M is a nearly square-shaped area, measuring 150 feet by 140 feet, located approximately 1,600 feet north of Site A. Plot M was used for radioactive waste burial.

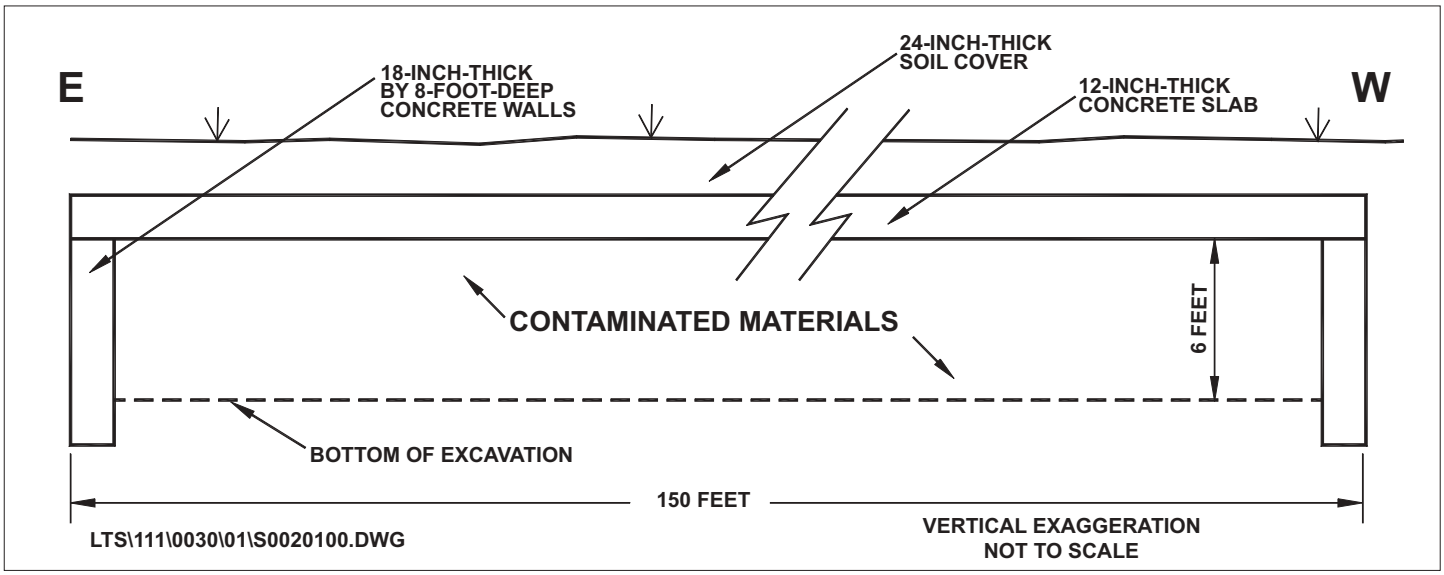


These sites are situated on a recessional moraine upland, with low rolling topography and water-filled kettle depressions. The region is densely forested, and the site is accessible to the public by recreational trails.

The sites are underlain by as much as 170 feet of glacial till overlying dolomite bedrock. Interbedded sands and low-permeability clayey zones result in perched groundwater in the upper portion of the till section. Unconfined groundwater is encountered in the till on top of the bedrock. Confined groundwater in the dolomite is used for domestic purposes within the forest preserve.

The sites were leased by the Federal Government from the owner, the Forest Preserve District of Cook County, from 1942 to 1956. In June 1997 when final remedial actions were completed, an agreement was executed between DOE and the Forest Preserve District to return the sites to the District.

The first reactor to achieve a self-sustaining and controlled chain reaction, CP–1, was moved from the University of Chicago to Site A in 1943 and renamed CP–2. A second reactor, CP–3, was constructed on the site in 1943. Operations of both reactors at Site A ceased in 1954, and the reactors were defueled in 1955.



East-West Cross Section of Plot M

Between 1944 and 1949, radioactive waste and contaminated laboratory equipment from these operations were buried in Plot M. Waste was buried in 6-foot deep trenches and covered with soil until 1948, after which burial took place in steel bins. The bins were relocated in 1949.

In 1973, above-background levels of tritium were detected in two nearby hand-pumped wells. Monitor well sample results indicated that tritium contamination was migrating from Site A/Plot M into the surrounding soil and groundwater. However, the concentration of contaminants was significantly below the limits for public radiation exposures.

Stabilization/Isolation Approach

In 1956, the CP–3 reactor shell was sealed and the access port in the top of the shield was filled with concrete. Buildings and support structures surrounding the two reactors were decontaminated and torn down.

An excavation approximately 100 feet across and 50 feet deep was prepared between the two reactors that were approximately 180 feet apart. The 800-ton concrete-filled shell of the CP–3 reactor was buried by excavating around it on three sides and detonating strategically placed explosives in the earthen "pedestal" supporting it. The reactor shell slid into the excavation. The concrete shield of CP–2 was demolished and pushed into the same excavation, along with building debris. The excavation containing the remains of CP–2 and CP–3 was then backfilled, leveled, and landscaped. The remaining buildings at Site A were razed, and the restored site was returned to the Forest Preserve District.

In 1956, Plot M was stabilized and isolated by encasing the sides and top of the burial area with concrete. The disposal area was surrounded by concrete walls 8 feet deep and 1.5 feet thick. A 1-foot-thick concrete cap was placed over the top of the entire disposal area. The concrete was covered with 2 feet of soil and was seeded with grass. An inscribed concrete marker was placed in the center of Plot M. The purpose of the concrete barrier is to prevent people from digging into the waste and to impede the flow of water through the buried radioactive materials.

In 1996, a limited removal action was conducted at Site A. Approximately 360 cubic yards of soil containing contaminant concentrations above background levels was removed and disposed of off site. The excavated areas were backfilled with low-permeability materials, covered with topsoil, and revegetated.

LTSM Program Activities

The DOE LTSM Program is responsible for the long-term safety and integrity of SiteA/Plot M. The primary activity of the LTSM Program at the site is an on-going, extensive program of groundwater, air, and surface water monitoring.

Contacts

For more information about the LTSM Program or about Site A/Plot M, contact

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or visit the Internet site at
http://www.gjo.doe.gov/programs/ltsm